5

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/851,133 | 05/09/2001 | Pierre-Albert Breton | 208301US2 | 2674 |

22850 7590 11/21/2003

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

| EXAMINER | |
|---|---|
| LAO, TIM P | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2655 | |

DATE MAILED: 11/21/2003 9

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 09/851,133 | BRETON, PIERRE-ALBERT |
| | Examiner | Art Unit |
| | Tim Lao | 2655 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7,9,11-17 and 19* is/are rejected.

7)☒ Claim(s) *5,6,8,10 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 7, and 16(1-4), 16(7) are rejected under 35 U.S.C. 102(e) as being anticipated by Pastor et al. [1] (US Patent No. 6,445,801 B1).

Regarding claim 1, Pastor et al. [1] disclose:

A method of voice recognition in a noise-ridden acoustic signal comprising:

a phase of digitizing and subdividing the noise-ridden acoustic signal "u(t)" into a sequence of temporal frames (Fig.1, 0; col.4, L.19-27);

a phase of parametrization of speech-containing temporal frames so as to obtain a vector of parameters, per frame, in the frequency domain, this vector of parameters expressing the acoustic contents of the frame (Fig.8, "Fourier Transform"; col.14, L.15-18);

a shape-recognition phase (Fig.1, 5; Fig.2, "s(n)"; [s(n) is the recognized or reconstruction of the noise-ridden signal.]

a phase of reiterative searching for successive noise models in the sequence of temporal frames, a new noise model replacing a current noise model, a noise model

comprising several successive frames (Fig.7, “starting of new search”, “storage of the active model”; col.9, L.40-52);

wherein the method comprises:

a phase of searching for a noise transition (energy incompatibility) between the new noise model and the current model (Fig.7, “initialization”, “reading…”, “computation…”, “comparison of energy values”, “comparison with energy of the previous model”);

and wherein, when the noise transition has been detected, the method comprises:

a phase of updating the new noise model (Fig.7, “storage of the active model”; col.10, L.31-43; col.12, L.43-48);

the parametrization phase including a step of matching the parameters to the new noise model (Fig.8, estimation of “$\gamma_i$, $\gamma_x$, and $E_x$”); [the estimation of the parameters ($\gamma_i$, $\gamma_x$, and $E_x$) of the new noise model shows the parametrization or extraction of vectors from the new noise model.]

Regarding claim 2, a method of voice recognition according to claim 1, wherein the phase of searching for a noise transition comprises a step of searching for an energy incompatibility and/or a step of searching for a spectral incompatibility between the new noise model and the current model, the detection of an incompatibility expressing a noise transition (Fig. 7, “initialization”, “reading…”, “computation…”, “comparison of energy values”, “comparison with energy of the previous model”).

Regarding claim 3, a method of voice recognition according to claim 2, wherein the step of searching for an energy incompatibility comprises the comparison of the ratio between the mean energy Enewmod of the new noise model and the mean energy of the current noise model Emodcurr with a low threshold S' and a high threshold S, an energy incompatibility being found if the ratio is outside the interval delimited by the two thresholds S, S' (Fig. 7, "comparison of energy values"; col.11, L.26-41). [i.e. S=3 and S'=1/S=1/3.]

Regarding claim 4, a method of voice recognition according to claim 3, wherein the step of searching for an energy incompatibility also comprises a comparison of the mean energy Enewmod of the new noise model and the mean energy of the current noise model Emodcurr with an energy floor threshold Emin (≤ 1/S) below which the noise is negligible, the energy incompatibility determined by the comparison of the ratio between the mean energy of the new noise model Enewmod and the mean energy of the current noise model Emodcurr being ignored when the mean energy of the new noise model Enewmod and the mean energy of the current noise model Emodcurr are both below the energy floor threshold Emin (Fig. 7, "stopping of preparation"; col. 11, L.60-67; col.12, L.1-3). [Emin could be a value ≤ 1/S (S'=1/S) in which case the comparison of ratio of mean energy is abandoned due to the in-significant presence of ambient noise.]

Regarding claim 7, a method of voice recognition according to claim 1, wherein the parametrization phase comprises:

a step of determining spectral coefficients Bi,par ("$\gamma_i(\nu)$, $\gamma_x(\nu)$"), each associated with a frequency channel i ($\nu$) each expressing a representation of the spectral energy of a frame containing speech in the frequency channel i (Fig.8, estimation of "$\gamma_i(\nu)$, $\gamma_x(\nu)$"; col.14, L.17-20).

the parameter-matching step comprising a determining, for each spectral coefficient Bi,par, of a robustness (variance) operator OpRob(Bi,par), this robustness operator expressing the confidence to be attached to the spectral coefficient Bi,par with respect to the noise level of the new noise model in the same frequency channel i (col.7, eq.8; col.8, L.10-18); [robustness implies variant in the coefficient $\alpha$, where $\alpha$= OpRob(Bi,par). Confidence attached to the spectral coefficient implies the weighting of the spectral coefficient on $\alpha$ as shown in eq.8.]

a weighting (multiplication by a factor) of the spectral coefficient Bi,par with the robustness operator OpRob(Bi,par) (col.7, eq.8; col.7, L.66-67; col.8, L.1-6; col.8, L.37); [eq.8 shows the weighting (multiplication by a factor) of the spectral coefficient max and $\gamma_x(\nu)/\gamma_u(\nu)$ on $\alpha$ ($\alpha$=OpRob(Bi,par)).]

a determining of the vector of parameters on the basis of the weighted spectral coefficients (Fig.8, "computation of the Wiener coefficient"; col.7, eq.8). [the Wiener coefficients is a vector of parameters sought on the basis of weighted spectral coefficients.]

Regarding claim 16, a system of voice recognition in a noise-ridden acoustic signal for the implementation of the method according to one of the claims 1 to 15, wherein the system comprises:

means to acquire the acoustic signal, digitize it and subdivide it into temporal frames (Fig.1, 0; col.4, L.19-27);

a parametrization chain to translate the temporal frames containing speech into vectors of parameters in the frequency domain (Fig.8, "Fourier Transform"; col.14, L.15-18);

shape-recognition means (Fig.1, 5; Fig.2, "s(n)"; [s(n) is the recognized or reconstruction of the noise-ridden signal.]

means for modelling the noise to reiteratively prepare noise models, a new noise model replacing a current noise model, means for detecting a noise transition between the new noise model and the current noise model (Fig.7, "initialization", "reading...", "computation...", "comparison of energy values", "comparison with energy of the previous model");

means to match the parametrization chain with the noise of the new noise model having activated the noise transition (Fig.8, estimation of "$\gamma_i$, $\gamma_x$, and $E_x$"); [the estimation of the parameters ($\gamma_i$, $\gamma_x$, and $E_x$) of the new noise model shows the parametrization or extraction of vectors from the new noise model.]

means to update the new noise model having activated the noise transition (Fig.7, "storage of the active model"; col.10, L.31-43; col.12, L.43-48).

[The implementation of the according to the invention can be done by means of a specialized computer system (col.13,L.40-50).]

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 9, 14, and 16(9), 16(14) are rejected under 35 U.S.C. 103(a) as being unpatentable over Pastor et al. [1] in view of Erell et al. (US Patent No. 5,778,34).

Regarding claim 9, Pastor et al. [1] show:

determining of a robustness operator OpRob(Bi,par) (col.7, eq.8; col.8, L.10-18); [robustness=variant; $\alpha$, where $\alpha$= OpRob(Bi,par). Confidence=weighting of the spectral coefficient on $\alpha$ as shown in eq.8.]

the weighting of the basic spectral coefficients Bi,par with the respective robustness operators OpRob(Bi,par) (col.7, eq.8; col.7, L.66-67; col.8, L.1-6; col.8, L.37); [eq.8 shows the weighting (multiplication by a factor) of the spectral coefficient max and $\gamma_x(\nu)/\gamma_u(\nu)$ on $\alpha$ ($\alpha$=OpRob(Bi,par)).]

matching the parameters (weighted spectral coefficient) to the new noise model (Fig.8, estimation of "$\gamma_i$, $\gamma_x$, and $E_x$");

Pastor et al. [1] do not show the reference space.

Erell et al. teach the use of a reference space (template) to do the comparison between vectors of parameters of the reference template and the test template (Fig.1, 28; col.1, L.61-67; col.2, L.1-14; col.3, L.38-45; col.5, L.24-44).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of determining the vectors of parameters in

the learning or training phase as shown by Pastor et al. [1] to include the use of reference space as taught by Erell et al. in order to determine the vectors of parameters in the reference space (i.e., the basic spectral coefficient Bi,base and the robustness operator OpRob(Bi,base)) and to compare the vector of parameters using Dynamic Time Wrapping (DTW) technique. DTW can be used to determine the best match between the reference vectors in the reference space and the test vectors in the learning phase (col.1, L.61-67; col.2, L.1-14).

Regarding claim 14, Pastor et al. [1] do not show the reference space.

Erell et al. teach the use of a reference space (template) to do the comparison between vectors of parameters of the reference template and the test template and the use of Hidden Markov Model (HMM) approach in the comparison process (Fig.1, 28; col.1, L.61-67; col.2, L.1-14).

The examiner takes official notice that it is well-known in the field of speech signal processing that Guassian probability distribution with a standard deviation can be used to describe the sequence of states in HMM. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of determining the vectors of parameters in the learning or training phase as shown by Pastor et al. [1] to include the use of reference space and HMM (Guassian probability with a standard deviation) as taught by Erell et al. in order to determine the vectors of parameters in the reference space (i.e., the basic spectral coefficient Bi,base and the robustness operator OpRob(Bi,base)) and to compare the vector of parameters

using the HMM. The HMM approach is an alternative approach to DTW (Erell et al., col2, L.6-14).

Regarding claim 16, Pastor et al. [1] disclose:

a system of voice recognition in a noise-ridden acoustic signal for the implementation of the method according to one of the claims 1 to 15, wherein the system comprises:

means to acquire the acoustic signal, digitize it and subdivide it into temporal frames (Fig.1, 0; col.4, L.19-27);

a parametrization chain to translate the temporal frames containing speech into vectors of parameters in the frequency domain (Fig.8, “Fourier Transform”; col.14, L.15-18);

shape-recognition means (Fig.1, 5; Fig.2, “s(n)”; [s(n) is the recognized or reconstruction of the noise-ridden signal.]

means for modelling the noise to reiteratively prepare noise models, a new noise model replacing a current noise model, means for detecting a noise transition between the new noise model and the current noise model (Fig.7, “initialization”, “reading…”, “computation…”, “comparison of energy values”, “comparison with energy of the previous model”);

means to match the parametrization chain with the noise of the new noise model having activated the noise transition (Fig.8, estimation of “$\gamma_i$, $\gamma_x$, and $E_x$”); [the estimation of the parameters ($\gamma_i$, $\gamma_x$, and $E_x$) of the new noise model shows the parametrization or extraction of vectors from the new noise model.]

means to update the new noise model having activated the noise transition (Fig.7, "storage of the active model"; col.10, L.31-43; col.12, L.43-48).

[The implementation of the according to the invention can be done by means of a specialized computer system (col.13,L.40-50).]

5. Claims 11-13 and 16(11-13) are rejected under 35 U.S.C. 103(a) as being unpatentable over Pastor et al. [1] in view of Erell et al., and further in view of Bialik (US Patent No. 5,673,364).

Regarding claims 11 and 13, Pastor et al. [1] and Erell et al. show:

the conversion of basic spectral coefficients into weighted basic spectral coefficients.

a determining of vectors of parameters in the reference space.

Pastor et al. [1] and Erell et al. do not show:

the compression of spectral coefficients.

However, Bialik teaches:

the compression of spectral coefficients in speech signal (col.1, L.63-67; col.2, L.5-8).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of converting basic spectral coefficients into weighted basic spectral coefficients as shown by Pastor et al. [1] and Erell et al. to include the method compression of spectral coefficients in speech signals as taught by Bialik in order for the compressed speech signal to be transmitted and stored more efficiently (col.1, L.16-18).

Regarding claim 12, Pastor et al. [1] and Erell et al. show:

a determining of the robustness operator OpRob(Bi,base) for each of the non-compressed basic spectral coefficients Bi,base;

a weighting of the basic spectral coefficients Bi,base.

Pastor et al. [1] and Erell et al. do not show:

the compression or non-compression of spectral coefficients.

However, Bialik teaches:

the compression and non-compression of spectral coefficients in speech signal (col.1, L.63-67; col.2, L.5-8).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of converting basic spectral coefficients into weighted basic spectral coefficients as shown by Pastor et al. [1] and Erell et al. to include the method compression and non-compression of spectral coefficients in speech signals as taught by Bialik in order for the compressed speech signal to be transmitted and stored more efficiently and for the non-compressed speech signal to be processed easily during the filtering phase (col.1, L.16-18).

Regarding claim 16, Pastor et al. [1] disclose:

a system of voice recognition in a noise-ridden acoustic signal for the implementation of the method according to one of the claims 1 to 15, wherein the system comprises:

means to acquire the acoustic signal, digitize it and subdivide it into temporal frames (Fig.1, 0; col.4, L.19-27);

a parametrization chain to translate the temporal frames containing speech into vectors of parameters in the frequency domain (Fig.8, "Fourier Transform"; col.14, L.15-18);

shape-recognition means (Fig.1, 5; Fig.2, "s(n)"; [s(n) is the recognized or reconstruction of the noise-ridden signal.]

means for modelling the noise to reiteratively prepare noise models, a new noise model replacing a current noise model, means for detecting a noise transition between the new noise model and the current noise model (Fig.7, "initialization", "reading...", "computation...", "comparison of energy values", "comparison with energy of the previous model");

means to match the parametrization chain with the noise of the new noise model having activated the noise transition (Fig.8, estimation of "$\gamma_i$, $\gamma_x$, and $E_x$"); [the estimation of the parameters ($\gamma_i$, $\gamma_x$, and $E_x$) of the new noise model shows the parametrization or extraction of vectors from the new noise model.]

means to update the new noise model having activated the noise transition (Fig.7, "storage of the active model"; col.10, L.31-43; col.12, L.43-48).

[The implementation of the according to the invention can be done by means of a specialized computer system (col.13,L.40-50).]

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pastor et al. [1] in view of Erell et al., and further in view of Pastor et al. [2] (US Patent No. 6,438,513 B1).

Regarding claim 17, Pastor et al. [1] do not show a reference space.

Erell et al. teach the use of a reference space (template) for shape recognition (Fig.1, 28; col.1, L.61-67; col.2, L.1-14; col.3, L.38-45; col.5, L.24-44).

Pastor et al. [2] teach the use memory space to store references of the noise model (Fig.4, "SRAM 1, 2" "DRAM1, 2"; col.8, L.55-69; col.9, L.1-18).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of voice recognition as shown by Pastor et al. [1] to include the use of reference space as taught by Erell et al. and the use of memory space or buffers as taught by Pastor et al. [2] in order for the references to be accessed and processed more efficiently by digital signal processors.

7. Claims 15, 16(15), and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pastor et al. [1] in view of Gulli et al. (US Patent No. 6,128,594).

Regarding claims 15 and 19, Pastor et al. [1] do not show:

the noise-suppression before parametrization phase.

Gulli et al. teach noise-suppression process in a noisy environment (col.2, L.65-67 ; col. 3, L.1-4).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the method of voice recognition as shown by Pastor et al. [1] to include the use of noise-suppression process in a noisy environment as taught by Gulli et al. in order to apply the noise-suppression before parametrization phase and thus to further suppress the noise before the filtering process.

Regarding claim 16, Pastor et al. [1] disclose:

a system of voice recognition in a noise-ridden acoustic signal for the implementation of the method according to one of the claims 1 to 15, wherein the system comprises:

means to acquire the acoustic signal, digitize it and subdivide it into temporal frames (Fig.1, 0; col.4, L.19-27);

a parametrization chain to translate the temporal frames containing speech into vectors of parameters in the frequency domain (Fig.8, "Fourier Transform"; col.14, L.15-18);

shape-recognition means (Fig.1, 5; Fig.2, "s(n)"; [s(n) is the recognized or reconstruction of the noise-ridden signal.]

means for modelling the noise to reiteratively prepare noise models, a new noise model replacing a current noise model, means for detecting a noise transition between the new noise model and the current noise model (Fig.7, "initialization", "reading...", "computation...", "comparison of energy values", "comparison with energy of the previous model");

means to match the parametrization chain with the noise of the new noise model having activated the noise transition (Fig.8, estimation of "$\gamma_i$, $\gamma_x$, and $E_x$"); [the estimation of the parameters ($\gamma_i$, $\gamma_x$, and $E_x$) of the new noise model shows the parametrization or extraction of vectors from the new noise model.]

means to update the new noise model having activated the noise transition (Fig.7, "storage of the active model"; col.10, L.31-43; col.12, L.43-48).

[The implementation of the according to the invention can be done by means of a specialized computer system (col.13,L.40-50).]

### *Allowable Subject Matter*

8. Claims 5, 6, 8, 10, 16(5), 16(6), 16(8), 16(10), 18(16/5), 18(16/6), 18(16/8), 18 (16/10), 19(16/5), 19(16/6), 19(16/8), and 19(16/10) are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Search and analysis of references do not show:

For claims 5, 16(5), 18(16/5), and 19(16/5),

a comparison of the ratio of the spectral coefficients Bi,newmod and Bi,modcurr;

the spectral incompatibility is found if the ratio is located outside the interval delimited by two threshold Sf, Sf'.

For claims 6, 16(6), 18(16/6), and 19(16/6),

the spectral incompatibility is ignored when Bi,newmod and Bi,modcurr are both below the floor spectral coefficient, Bi,min.

For claims 8 and 10, 16(8), 16(10), 18(16/8), 18(16/10), 19(16/8), and 19(16/10) the claimed mathematical relationship.

### *Conclusion*

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent Documents:

A). 5,337,251 08/1994 Pastor

B). 6,1888,982 B1 02/2001 Chiang

C). 5,706,395 01/1998 Arslan et al.

Other Publications:

D). Yoma et al., "Weighted matching algorithms and reliability in noise cancelling by spectral subtraction," ICASSP-97, vol.2, pp.1171-1174, Apr. 1997.

E). J H L Hansen, "Analysis and compensation of speech under stress and noise for environmental robustness in speech recognition," Speech Communication, Special Issue on Speech Stress, vol. 20 (2), pp.151-170, Nov. 1996.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tim Lao whose telephone number is 703-305-8955. The examiner can normally be reached on M-F, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703-305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-305-9508.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9000.

Tim Lao
Examiner
Art Unit 2655

TL
11/14/2003

11/17/03

DORIS H. TO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600